

C L A I M S

1. A process for improving the binding capability of a fish material, characterized in that a collagen containing fish material is subjected to a gelatine liberation step in order to improve the inherent binding capability of said fish material.
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2. A process in accordance with claim 1, characterized in that the collagen containing fish material is selected from the group comprising connective tissues, skin and bones from fish.
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3. A process in accordance with claim 1, characterized in that said fish material is selected from the group comprising a) bone from fish by-products, b) skin from fish by-products, c) whole fish for processing to feed, d) whole fish for processing to feed ingredient and e) bone containing intermediate products from fish meal processing.
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4. A process in accordance with claim 1, characterized in that said gelatine liberation step is a physical and/or chemical conversion of insoluble collagen in said collagen containing fish material to a water soluble gelatinous material.
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5. A process in accordance with claim 1, characterized in that the gelatinous material is not isolated or extracted from the fish material.
6. A process in accordance with claim 1, characterized in that the gelatine liberation step is conducted by adding an aqueous liquid to the fish material, and thereafter heating the mixture of fish material and liquid to at least 50°C for at least 3 hours.
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7. A process in accordance with claim 6, characterized in that the gelatine liberation step is conducted by heating the mixture at about 100°C.
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8. A process in accordance with claim 6, characterized in that the gelatine liberation step is conducted by heating the mixture in about 10 hours.

9. A process in accordance with claim 6, characterized in that the ratio of fish material to water is in the range of 1:10 to 1:1, preferable 1:5 to 1:2, most preferable about 1:3, based on weight/weight.

10. A process in accordance with claim 4, characterized in the liberation of gelatine is conducted by high pressure cooking.

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11. A process in accordance with claim 4, characterized in that the liberation of gelatine is conducted by repeated or continuous extraction by hot processing.

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12. A process in accordance with claim 4, characterized in that the liberation of gelatine is conducted by repeated or continuous extraction by hot stickwater from the fish meal processing.

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13. A process in accordance with one of the preceding claims, characterized in that said gelatine liberation step is included in the conventional processing of a fish material to a fish meal product.

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14. A process in accordance with one of the preceding claims, characterized in that said gelatine liberation step is included in the conventional processing of a fish material to a fish feed product.

15. A process in accordance with one of the preceding claims, characterized in that said gelatine liberation step is included in the conventional processing of a fish material to a fish product for human consumption such as for instance fish forcemeat, fish balls or fish cakes.

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16. A process for improving the biological digestibility of a feed product made of a raw material comprising as a minor or substantial fraction of bone tissues, characterized in that the raw material is subjected to a process of gelatine liberation wherein the proteins in the bone tissue are made digestible.

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17. A process for improving the biological digestibility of a feed product made of a raw material comprising as a minor or substantial fraction of bone tissues, characterized in that the raw material is subjected to a process of acid or alkaline treatment wherein minerals in the bone tissue are made soluble.

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18. A process in accordance with claim 17, characterized in that the treatment is conducted by the addition of hydrochloric acid.

19. A process in accordance with claim 18, characterized in that the concentration of said hydrochloric acid is 0,1 to 10 M, preferable 0,5 to 3M.

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20. A process in accordance with one of the claims 17 - 19, characterized in that the solubilization of minerals from bones are conducted as a process step in the process line of a conventional manufacturing of a feed product.

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21. A process in accordance with one of the claims 17 - 19, characterized in that a fraction containing solubilized minerals is added as an ingredient to a feed product.

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22. A process in accordance with one of the claims 17-21, characterized in that said bone tissue is fish bones.

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23. A process for increasing the binding capability and the biological digestibility of a product, characterized in that a collagen and bone tissue containing raw material is subjected to both a gelatine liberation step in order to improve the inherent binding capability and a process of acid or alkaline treatment wherein minerals in the bone tissue are made soluble.

24. A process in accordance with claim 23, characterized in that a process according to one of the claims 1 to 16 is used in combination with a process according to claim 17 to 21.

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25. A process in accordance with one of the claims 22 and 23, characterized in that the collagen and bone tissue containing raw material is a fish material.

26. A process in accordance with one of the claims 22 - 25, characterized in that raw material get a higher temperature load than equivalent to 90°C in more than 40 minutes, and that a hot processing liquid is used to extract gelatine from the collagen source.

10 27. A product with improved binding capability and biological digestibility, characterized in that the product is manufactured of a collagen and bone tissue containing raw material which is subjected to both a gelatine liberation step in order to improve the inherent binding capability and a process of acid or alkaline treatment wherein minerals in the bone tissue are made soluble.

15 28. A product in accordance with claims 27, characterized in that the collagen and bone tissue containing raw material is a fish material.

20 29. A product in accordance with one of the claims 27 or 28, characterized in that said product is manufactured by a process according to one of the claims 1 to 16 in combination with a process according to claim 17 to 21.

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30. A product in accordance with one of the claims 27 - 29, characterized in that the product is used as a supplement ingredient in the manufacturing of a pharmaceutical, veterinary, food and cosmetic products.